

EXHIBIT 4

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

GESTURE TECHNOLOGY PARTNERS, LLC,
Patent Owner.

IPR2021-00921
Patent 8,878,949 B2

Before PATRICK R. SCANLON, GREGG I. ANDERSON, and
BRENT M. DOUGAL, *Administrative Patent Judges*.

SCANLON, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Apple Inc. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 1–18 of U.S. Patent No. 8,878,949 B2 (Ex. 1001, “the ’949 patent”). Gesture Technology Partners, LLC (“Patent Owner”) filed a Preliminary Response (Paper 6, “Prelim. Resp.”).

We have authority to determine whether to institute an *inter partes* review. *See* 35 U.S.C. § 314 (2018); 37 C.F.R. § 42.4(a) (2020). To institute an *inter partes* review, we must determine that the information presented in the Petition shows “a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a). For the reasons set forth below, we determine that the information presented in the Petition establishes a reasonable likelihood that Petitioner will prevail with respect to at least one challenged claim. Accordingly, an *inter partes* review is hereby instituted.

II. BACKGROUND

A. *Real Parties in Interest*

Petitioner identifies itself as the real party in interest. Pet. 65. Patent Owner identifies itself as the real party in interest. Paper 4, 1.

B. *Related Matters*

The parties identify the following proceedings as related matters involving the ’949 patent: *Gesture Technology Partners, LLC v. Apple Inc.*, No. 6:21-cv-00121 (W.D. Tex.); *Gesture Technology Partners, LLC v. Lenovo Group Ltd.*, No. 6:21-cv-00122 (W.D. Tex.); *Gesture Technology Partners, LLC v. LG Electronics, Inc.*, No. 6:21-cv-00123 (W.D. Tex.); *Gesture Technology Partners, LLC v. Huawei Device Co., Ltd.*, No. 2:21-cv-00040 (E.D. Tex.); and *Gesture Technology Partners, LLC v. Samsung Electronics Co., Ltd.*, No. 2:21-cv-00041 (E.D. Tex.). Pet. 65; Paper 4, 1.

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In addition, Patent Owner identifies the following *inter partes* review proceedings as related matters: IPR2021-00917; IPR2021-00920; IPR2021-00922; and IPR2021-00923. Paper 4, 2.

C. The '949 Patent

The '949 patent, titled “Camera Based Interaction and Instruction,” issued November 4, 2014, with claims 1–18. Ex. 1001, codes (45), (54), 15:21–16:50. The '949 patent relates to “enhanc[ing] the quality and usefulness of picture taking for pleasure, commercial, or other business purposes.” *Id.* at 1:4–6. In one embodiment, “stereo photogrammetry is combined with digital image acquisition to acquire or store scenes and poses of interest, and/or to interact with the subject in order to provide data to or from a computer.” *Id.* at 1:6–10.

Figure 2A of the '949 patent is reproduced below.

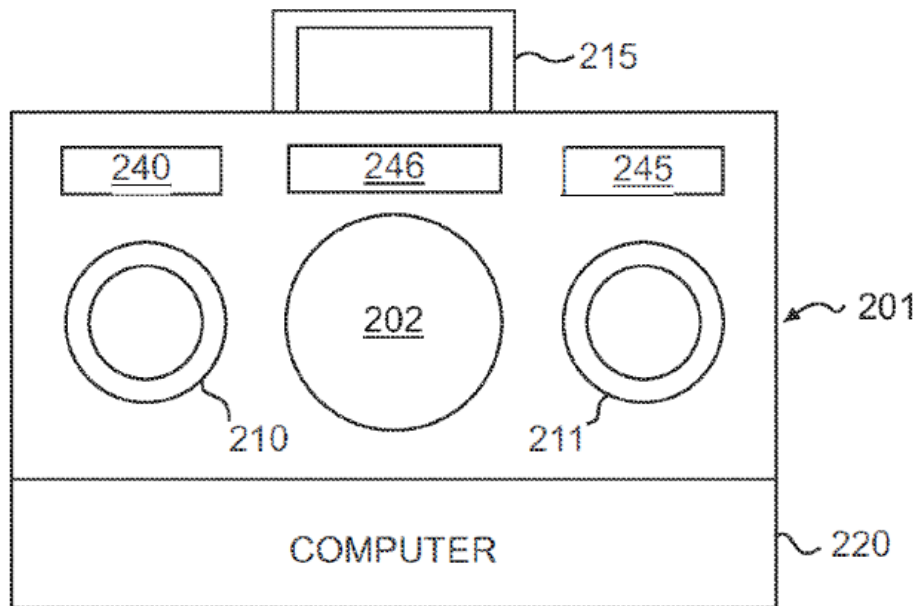


FIG. 2A

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Figure 2A illustrates still camera system 201, which includes central camera 202 having high resolution and color accuracy for picture taking. *Id.*

at 4:66–5:2. Camera system 201 also includes two cameras 210, 211 on either side of central camera 202. *Id.* at 5:2–3. Cameras 210, 211 “may be lower resolution (allowing lower cost, and higher frame rate, as they have less pixels to scan in a given frame time), with little or no accurate color capability, as they are used to simply see object positions or special datum positions on objects.” *Id.* at 5:3–7.

Camera system 201 further includes computer 220 that processes data from cameras 210, 211 “to get various position and/or orientation data concerning a person.” *Id.* at 5:24–26. “In general, one can use the system to automatically ‘shoot’ pictures” in response to a particular event, such as the subject undertaking a particular position or gesture—i.e., a silent command to take a picture. *Id.* at 5:30–49.

D. Challenged Claims

As noted above, Petitioner challenges claims 1–18 of the ’949 patent. Claims 1, 8, and 13 are independent. Claim 1 is illustrative of the claimed subject matter and is reproduced below:

1. A portable device comprising:
 - a device housing including a forward facing portion, the forward facing portion of the device housing encompassing an electro-optical sensor having a field of view and including a digital camera separate from the electro-optical sensor; and
 - a processing unit within the device housing and operatively coupled to an output of the electro-optical sensor, wherein the processing unit is adapted to:

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determine a gesture has been performed in the electro-optical sensor field of view based on the electro-optical sensor output, and

control the digital camera in response to the gesture performed in the electro-optical sensor field of view, wherein the gesture corresponds to an image capture command, and wherein the image capture command causes the digital camera to store an image to memory.

Ex. 1001, 15:21–38.

E. Asserted Grounds of Unpatentability

Petitioner contends that the challenged claims would have been unpatentable on the following grounds:¹

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–18	103(a)	Numazaki, ² Nonaka ³
6, 12, 17	103(a)	Numazaki, Nonaka, Aviv ⁴

Pet. 6–7. Petitioner supports its challenge with the Declaration of Dr. Benjamin B. Bederson (Ex. 1003).

III. ANALYSIS

A. Level of Ordinary Skill in the Art

In determining whether an invention would have been obvious at the time it was made, 35 U.S.C. § 103 requires us to resolve the level of ordinary skill in the pertinent art at the time of the effective filing date of the claimed invention. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). The

¹ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. § 103. Because the ’949 patent has an effective filing date before the March 16, 2013, effective date of the applicable AIA amendments, we apply the pre-AIA version of 35 U.S.C. § 103.

² US 6,144,366, issued Nov. 7, 2000 (Ex. 1004).

³ JP H4-73631, published Mar. 9, 1992 (Ex. 1005).

⁴ US 5,666,157, issued Sept. 9, 1997 (Ex. 1006).

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person of ordinary skill in the art is a hypothetical person who is presumed to have known the relevant art. *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). Factors that may be considered in determining the level of ordinary skill in the art include, but are not limited to, the types of problems encountered in the art, the sophistication of the technology, and educational level of active workers in the field. *Id.* In a given case, one or more factors may predominate. *Id.*

Petitioner contends that a person having ordinary skill in the art “would have had at least a bachelor’s degree in electrical engineering or equivalent with at least one year of experience in the field of human computer interaction,” and “[a]dditional education or experience might substitute for the above requirements.” Pet. 5–6 (citing Ex. 1003 ¶¶ 29–31). Patent Owner does not dispute Petitioner’s definition for the purposes of its Preliminary Response. Prelim. Resp. 5.

Based on our review of the record before us, we determine that Petitioner’s stated level of ordinary skill in the art is reasonable because it is consistent with the evidence of record, including the asserted prior art. Accordingly, for the purposes of this Decision, we adopt Petitioner’s definition.

B. Claim Construction

In *inter partes* reviews, the Board interprets claim language using the district-court-type standard, as described in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). See 37 C.F.R. § 42.100(b) (2020). Under that standard, we generally give claim terms their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art at the time of the invention, in light of the language of the claims, the specification, and the prosecution history. See *Phillips*, 415 F.3d at

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1313–14. Although extrinsic evidence, when available, may also be useful when construing claim terms under this standard, extrinsic evidence should be considered in the context of the intrinsic evidence. *See id.* at 1317–19.

Petitioner proposes claim constructions for the phrases “the image capture command causes the digital camera to store an image to memory” in claim 1, “capturing an image to the digital camera in response to . . . the image capture command” in claim 8, and “correlate the gesture detected . . . with an image capture function and subsequently capture an image using the digital camera” in claim 13. Pet. 8. Specifically, Petitioner asserts that these phrases “should be construed broadly enough to encompass capturing/storing video or still images,” and provides reasons supporting its assertion. *Id.* at 8–10. Patent Owner does not contest Petitioner’s proposed claim constructions at this stage of the proceeding. Prelim. Resp. 5. Accordingly, we adopt Petitioner’s proposed claim constructions for the purposes of this Decision.

The parties are hereby given notice that claim construction, in general, is an issue to be addressed at trial and claim constructions expressly or implicitly addressed in this Decision are preliminary in nature. Claim construction will be determined at the close of all the evidence and after any hearing. The parties are expected to assert all of their claim construction arguments and evidence in the Petition, Patent Owner’s Response, Petitioner’s Reply, Patent Owner’s Sur-reply, or otherwise during trial, as permitted by our rules.

C. Asserted Obviousness Based on Numazaki and Nonaka

Petitioner asserts that claims 1–18 of the ’949 patent are unpatentable under 35 U.S.C. § 103(a) based on Numazaki and Nonaka. Pet. 10–49. Patent Owner provides arguments addressing this asserted ground of

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unpatentability. Prelim. Resp. 6–28. We first summarize the references and then address the parties’ contentions.

1. Numazaki

Numazaki “relates to a method and an apparatus for generating information input in which input information is extracted by obtaining a reflected light image of a target object.” Ex. 1007, 1:8–11. An information input generation apparatus according to a first embodiment includes lighting unit 101, reflected light extraction unit 102, feature data generation unit 103, and timing signal generation unit 104. *Id.* at 10:23–28, Fig. 1. Light emitting unit 101 emits light that varies in intensity in time according to a timing signal from timing signal generation unit 104. *Id.* at 10:29–31. The light is directed onto a target object, and light reflected from the target object is extracted by reflected light extraction unit 102. *Id.* at 10:31–35. Feature data generation unit 103 extracts feature data from the reflected light image. *Id.* at 10:57–58. “When the target object is a hand, it becomes possible to obtain the information regarding a gesture or a pointing according to the feature data extracted from the reflected light image of the hand, for example, and it becomes possible to operate a computer by using this obtained information.” *Id.* at 10:61–66.

Figure 2, reproduced below, depicts a detailed block diagram of the information input generation apparatus of the first embodiment. *Id.* at 5:11–12, 11:9–11.

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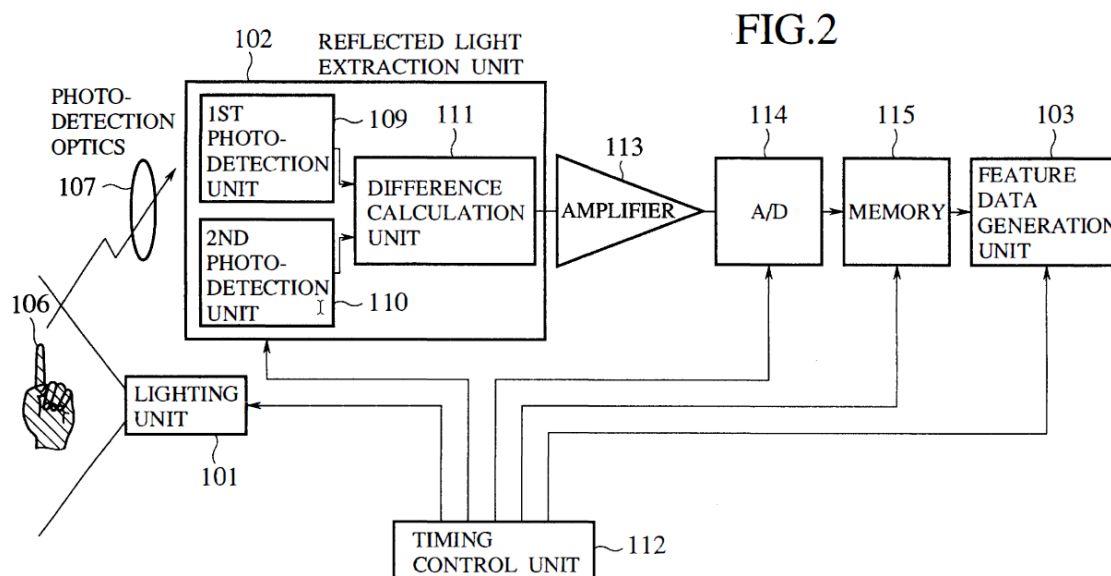


Figure 2 shows that light emitted from lighting unit 101 is reflected by target object 106, such that an image is formed on a photo-detection plane of reflected light extraction unit 102. *Id.* at 11:11–14. Reflected light extraction unit 102 includes first photo-detection unit 109, second photo-detection unit 110, and difference calculation unit 111. *Id.* at 11:16–19. Timing control unit 112 causes lighting unit 101 to emit light when first photo-detection unit 109 is in a photo-detecting state and not to emit light when second photo-detection unit 110 is in a photo-detecting state. *Id.* at 11:26–32. Accordingly, first photo-detection unit 109 receives the light emitted from lighting unit 101 that is reflected by target object 106 and external light, such as illumination light or sunlight, but second photo-detection unit 110 receives the external light only. *Id.* at 11:33–39.

Difference calculation unit 111 calculates and outputs the difference between the image detected by first photo-detection unit 109 and the image detected by second photo-detection unit 110, which difference corresponds to the light emitted from lighting unit 101 that is reflected by target object 106. *Id.* at 11:43–55. The output from reflected light extraction unit 102 is

amplified by amplifier 113, converted from analog signals into digital signals by analog-to-digital converter 114, and stored at memory 115. *Id.* at 11:61–64. At an appropriate time, the data stored in memory 115 is read out and processed by feature data generation unit 103. *Id.* at 11:64–66.

Numazaki also discloses a third embodiment that “is directed to another exemplary case of the feature data generation unit of the first embodiment, which realizes a gesture camera for recognizing the hand action easily and its application as a pointing device in the three-dimensional space.” *Id.* at 29:4–8. Figure 23, reproduced below, shows the feature data generation unit of the third embodiment. *Id.* at 6:4–6, 29:9–10.

FIG.23

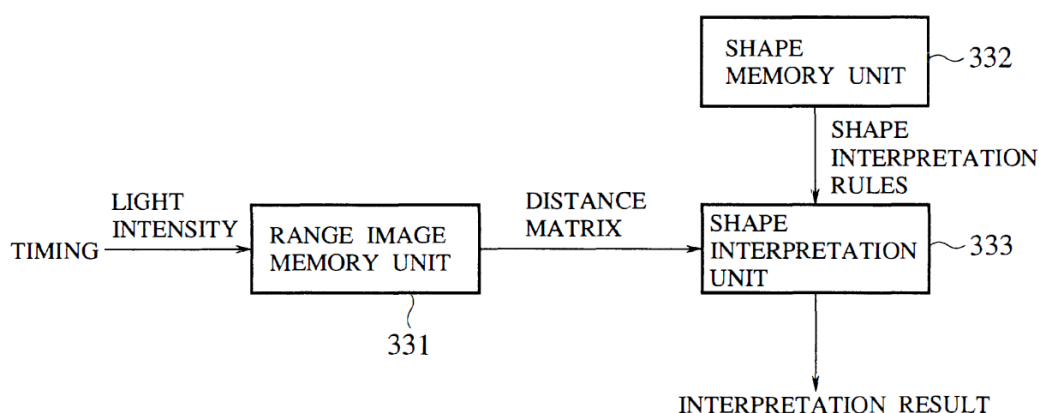


Figure 23 shows that the feature data generation unit includes range image memory unit 331 for storing a distance matrix, shape memory unit 332 for storing shape interpretation rules, and shape interpretation unit 333 for interpreting a shape of the distance matrix according to the shape interpretation rules. *Id.* at 29:11–18. Shape interpretation unit 333 performs the processing for determining if a matching shape interpretation rule exists. *Id.* at 29:28–38, Fig. 25. When a matching shape is found, a command corresponding to that shape is outputted. *Id.* at 30:2–3. Thus, this

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embodiment uses hand gesture recognition as a trigger for inputting a command into a computer and can also be used to power on and off a device such as a TV or lighting equipment. *Id.* at 31:3–10.

In addition, Numazaki discloses a fifth embodiment that “is directed to another exemplary case of the feature data generation unit in the first embodiment” that uses a video compression technique that extracts only useful image information to lower communications costs. *Id.* at 39:6–20. Figure 46, reproduced below, shows the feature data generation unit according to the fifth embodiment. *Id.* at 7:4–6, 39:21–23.

FIG.46

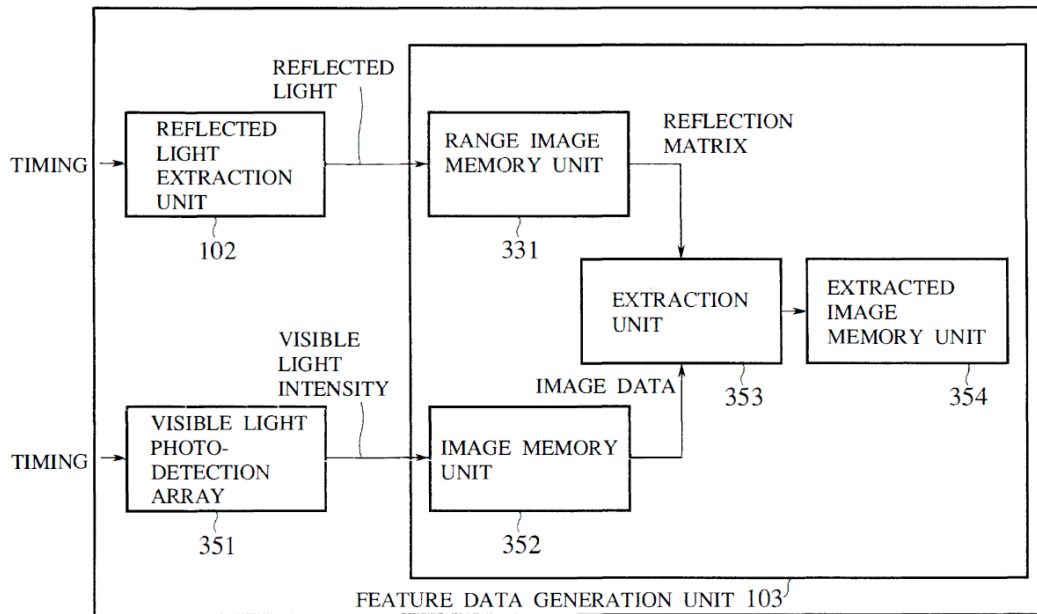


Figure 46 shows feature data generation unit 103 in conjunction with reflected light extraction unit 102 and visible light photo-detection array 351, which is generally a CCD camera for taking video images. *Id.* at 39:24–41. Images captured by visible light photo-detection array 351 are stored in image memory unit 352, and a mask (i.e., the image detected by reflected light extraction unit 102) is stored in range image memory unit

331. *Id.* at 39:51–57. Extraction unit 353 superposes the original image and the mask, leaving only the overlapping portion. *Id.* at 39:57–59.

Numazaki also discloses an eighth embodiment that “is directed to a system configuration incorporating the information input generation apparatus” described in the previous embodiments. *Id.* at 50:21–24. Figure 74, reproduced below, shows a computer equipped with the information input generation apparatus. *Id.* at 8:31–34, 50:25–26.

FIG.74

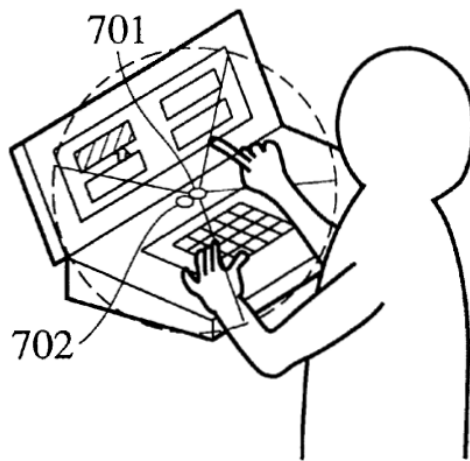


Figure 74 depicts a portable computer having a keyboard and a display integrated with the computer body. *Id.* at 50:26–29. Lighting unit 701 and photo-detection sensor unit 702 are positioned beyond the keyboard. *Id.* at 50:30–33.

2. Nonaka

Nonaka relates to a camera equipped with a remote release device. Ex. 1005, 2:1–3. In one embodiment, a “photographer gives a release instruction by means of a predetermined motion towards the camera in conjunction with the display timing of the aforementioned display patterns, the distance measurement device . . . detects this motion by the subject . . . ,

and [an] exposure is carried out.” *Id.* at 3:35–38. Nonaka describes that an objective of this invention is to provide “a remote release device-equipped camera which enables remote release operations without using a transmitter or receiver to give a release instruction, thereby achieving a higher degree of freedom, good portability, and cost benefits.” *Id.* at 2:26–29.

3. *Independent Claim 1*

Petitioner contends that the proposed combination of Numazaki and Nonaka discloses the limitations of challenged claim 1. Pet. 10–33. In particular, Petitioner relies on: (1) Numazaki’s first embodiment as teaching using the reflected light extraction unit to detect an object such as a user’s hand; (2) Numazaki’s third embodiment as teaching detecting when the user has performed a pre-registered gesture by comparing the output of the reflected light extraction unit to stored data reflecting pre-registered gestures or hand positions and instructing the device to implement a command corresponding to the gesture; (3) Numazaki’s fifth embodiment as teaching taking video images with visible light photo-detection array 351; and (4) Numazaki’s eighth embodiment as teaching portable devices that implement the information input generation apparatus described in the other embodiments. *Id.* at 20 (citing Ex. 1004, 4:32–35, 29:19–30:5, 31:3–10, 39:21–60, 50:19–24). Regarding these embodiments, Petitioner argues that,

[a]lthough *Numazaki* does not expressly describe combining all these features into a single portable device such that a user could perform a gesture command (pursuant to its third embodiment) that causes video capture to initiate (pursuant to its fifth embodiment), a [person having ordinary skill in the art] would have been motivated to implement *Numazaki*’s portable device in this manner pursuant to *Nonaka*’s image capture command gesture teachings.

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Id. at 20–21. For example, Petitioner argues that combining Numazaki’s embodiments as proposed would have improved Numazaki’s portable devices in the same way that Nonaka’s gesture-based image capture functionality benefits its camera device. *Id.* at 21 (citing Ex. 1003 ¶¶ 48–49; *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007)). That is, Petitioner argues that Nonaka’s “gesture-based image capture solution ‘achiev[es] a higher degree of freedom, good portability, and cost benefits,’” and one of ordinary skill in the art “would have recognized that these same benefits would be realized in *Numazaki’s* laptop.” *Id.* (citing Ex. 1006, 2:26–29) (alteration in original). Petitioner also identifies certain passages in Numazaki and explains the significance of each passage with respect to the corresponding claim limitation. *Id.* at 25–33.

Patent Owner argues that Petitioner has failed to show that the cited references disclose certain limitations of claim 1 and has failed to provide sufficient reasoning to combine the references. Prelim. Resp. 6–17. We address Patent Owner’s arguments in turn.

a) Limitation [1(a)]: “a device housing including a forward facing portion, the forward facing portion of the device housing encompassing an electro-optical sensor having a field of view and including a digital camera separate from the electro-optical sensor”

Patent Owner argues that the combination of Numazaki and Nonaka does not teach or suggest limitation [1(a)]. Prelim. Resp. 6. Specifically, Patent Owner argues that Petitioner contends that this limitation is met by incorporating Numazaki’s fifth embodiment into Numazaki’s eighth embodiment, wherein the laptop of the eighth embodiment is the claimed “device housing,” and reflected light extraction unit 102 and visible light photo-detection array 351 of the fifth embodiment correspond to the claimed “electro-optical sensor” and “digital camera,” respectively. *Id.* at 6–7 (citing

Pet. 26–28). According to Patent Owner, however, photo-detection sensor unit 702 of the eighth embodiment (which Patent Owner contends corresponds to reflected light extraction unit 102 or visible photo-detection array 351 in the proposed combination) “is located on the same upward facing portion of the laptop as the keyboard, and just ‘beyond the keyboard when viewed from an operator side.’” *Id.* at 9 (quoting Ex. 1004, 50:31–33). Patent Owner further argues that this upward facing portion of the laptop is not forward facing and, even if photo-detection sensor unit 702 has a forward-facing field of view, it is not located on a forward-facing portion of the laptop. *Id.*

We do not agree with Patent Owner’s argument. Petitioner argues that one of ordinary skill in the art would have been motivated to implement the videoconference functionality of Numazaki’s fifth embodiment into the laptop of the eighth embodiment. Pet. 26. To accomplish this implementation, Petitioner argues that Numazaki’s two-camera reflected light extraction unit 102 would have been used in conjunction with visible photo-detection array 351. *Id.* at 26–27 (citing Ex. 1004, 39:21–49). Petitioner also argues that, because the output of reflected light extraction unit 102 is processed to define which portions of the video captured by visible photo-detection array 351 are retained, one of ordinary skill in the art would have understood that both reflected light extraction unit 102 and visible photo-detection array 351 are forward facing. *Id.* at 27–28 (citing Ex. 1004, 39:24–60, Fig. 48; Ex. 1003 ¶ 52).

As such, we do not read the Petition as asserting that either reflected light extraction unit 102 or visible photo-detection array 351 physically replaces photo-detection sensor unit 702. Instead, as discussed above, Petitioner relies on the fifth embodiment’s disclosure of using forward-facing

reflected light extraction unit 102 and visible photo-detection array 351 together. The test for obviousness is not whether the features of one embodiment may be bodily incorporated into another embodiment to produce the claimed subject matter; rather, it is what the combination of embodiments makes obvious to one of ordinary skill in the art. *See In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012) (“It is well-established that a determination of obviousness based on teachings from multiple references does not require an actual, physical substitution of elements.”).

Furthermore, neither party has offered an express construction for the claim term “forward facing portion,” and we do not agree, based on the current record, that the portion of Numazaki’s laptop encompassing photo-detection sensor unit 702 cannot be considered as “forward facing.” Indeed, Figure 74 depicts this portion of the laptop to be slanted and facing both upward and forward. We, thus, are persuaded at this preliminary stage that Numazaki’s laptop includes a forward-facing portion that includes photo-detection sensor unit 702. We invite the parties to brief the proper construction of “forward facing portion” during trial, if desired, and we will address this limitation on the complete trial record, including any claim construction analysis for the term “forward facing portion,” to the extent included in the record.

b) Limitation [1(b)]: “a processing unit within the device housing and operatively coupled to an output of the electro-optical sensor, wherein the processing unit is adapted to: determine a gesture has been performed in the electro-optical sensor field of view based on the electro-optical sensor output”

First, Patent Owner argues that Numazaki requires two, not one, images from different photo-detection units to perform an analysis of a target object and identify a gesture. Prelim. Resp. 10–11. Accordingly,

Patent Owner argues that Numazaki “does not teach or suggest a processing unit capable of ‘determin[ing] a gesture has been performed’ based on the output of one or more electro-optical sensors, as set forth in claim element [1(b)].”⁵ *Id.* at 12 (alteration in original). Patent Owner also argues that “Numazaki does not teach or suggest ‘determin[ing] a gesture has been performed’ absent the other hardware that Numazaki identifies as necessary, such as the lighting unit, the image-subtraction circuitry, and the associated timing circuitry.” *Id.* (alteration in original).

These arguments are not persuasive because claim 1 employs the open-ended language “comprising,” and thus does not preclude additional elements. *See Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501 (Fed. Cir. 1997) (discussing “open ended” claim terms, such as “comprising”). Specifically, claim 1 does preclude determining that a gesture has been performed based on the output of more than one electro-optical sensor. Nor does claim 1 preclude additional hardware such as a lighting unit, image-subtraction circuitry, and timing circuitry.

Second, Patent Owner argues that the Petition requires that both of Numazaki’s third and fifth embodiments are implemented into the eighth embodiment, but reflected light extraction unit 102 operates differently in the third and fifth embodiments. Prelim. Resp. 12–13 (citing Ex. 1004, 29:5–18, 39:26–31, 39:50–60, Figs. 23, 46, 48). According to Patent Owner, “the Petition requires that reflected light extraction unit 102 be

⁵ Although referring to “one or more electro-optical sensors,” it appears that Patent Owner intended to argue that Numazaki does not disclose determining that a gesture has been performed based on the output of *one* sensor. One or more sensors would include the two sensors that Patent Owner argues Numazaki requires.

modified to generate both a ‘reflection matrix’ and a ‘distance matrix,’” but “there is no motivation for doing so” because “Numazaki’s third and fifth embodiments are disclosed as disparate embodiments.” *Id.* at 13.

This argument is not persuasive because it mischaracterizes Petitioner’s position. We do not read the Petition as proposing to modify Numazaki’s reflected light extraction unit 102 so as to generate both a reflection matrix in accordance with the fifth embodiment and a distance matrix in accordance with the third embodiment. Rather, Petitioner relies on the fifth embodiment as disclosing videoconference functionality (Pet. 26–29) and the third embodiment as disclosing gesture recognition (*id.* at 29–30). As for the reflected light extraction unit, Petitioner relies on reflected light extraction unit 102 of the fifth embodiment, which Petitioner contends is the same two-camera reflected light extraction unit 102 used in the first embodiment. *Id.* at 26 & n.2.

c) *Limitation [1(c)]: “control the digital camera in response to the gesture performed in the electro-optical sensor field of view, wherein the gesture corresponds to an image capture command, and wherein the image capture command causes the digital camera to store an image to memory”*

Patent Owner argues that, although the Petition combines Numazaki’s third, fifth, and eighth embodiments to meet limitation [1(c)], there is no motivation to do so for several reasons. Prelim. Resp. 14. First, Patent Owner argues that “Numazaki explicitly delineates multiple embodiments” and teaches away from combining the third and fifth embodiments because these “embodiments effectively disclose competing implementations for the [feature data generation unit].” *Id.* at 14–15 (citing Ex. 1004, 10:21–27, 29:1, 29:4–8, 39:3, 39:17–20, 39:50–60, Figs. 1, 23, 46, 48).

We disagree that the implementations of the feature data generation unit for the third and fifth embodiments are “competing” to the degree that they are incompatible or teach away from combining aspects of the embodiments. Numazaki discloses that both the third and fifth embodiments are directed to other exemplary cases of the feature data generation unit of the first embodiment (Ex. 1004, 29:4–8, 39:17–20), thereby suggesting that the alternative implementations of the feature data generation unit can be used in place of the feature data generation unit of the first embodiment. In other words, Numazaki suggests that the various implementations are interchangeable. The mere fact that Numazaki’s third and fifth embodiments disclose different feature data generation units would not have discouraged one of ordinary skill in the art from considering and combining various aspects of the embodiments. For these reasons, we disagree with Patent Owner’s arguments at this stage of the proceeding.

Second, Patent Owner challenges Petitioner’s argument that one of ordinary skill in the art would have combined Numazaki’s embodiments in the manner proposed to achieve a higher degree of freedom, good portability, and cost benefits as taught by Nonaka. Prelim. Resp. 15. Specifically, Patent Owner argues that “Nonaka teaches that ‘a higher degree of freedom, good portability, and cost benefits’ result from *not* making a camera operable via a remote-control unit,” but “Numazaki is completely silent regarding the existence of remote-control units and the use of remote-control units to operate a camera.” *Id.* (citing Ex. 1005, 2). Thus, in Patent Owner’s view, Petitioner’s reason for combining Numazaki’s embodiments is based on solving a problem that Numazaki never had. *Id.*

We agree that Nonaka discloses that its gesture-based image capture functionality provides a higher degree of freedom, good portability, and cost

benefits relative to a remote release operation that uses a transmitter or receiver. *See* Ex. 1005, 2:26–29. We disagree, however, that this disclosure would have only suggested to one of ordinary skill in the art *replacing a remote control unit* with a gesture-based image capture functionality. Rather, it is reasonable to conclude that one of ordinary skill in the art would have recognized that Nonaka’s gesture-based image capture functionality was a desirable technique for triggering image capture in general.

Here, Petitioner appears to take that position, arguing that “*Nonaka* explains that *users desired the ability to remotely trigger image capture*, but that then-existing options were limited to self-timer mechanisms and expensive wireless remote controls—both of which were undesirable.” Pet. 21 (citing Ex. 1006, 2:6-25) (second emphasis added). In other words, Petitioner relies on Nonaka as teaching the desirability of remotely triggering image capture *and* using gesture-based image capture functionality to do so. In addition, the Petition is supported by Dr. Bederson’s testimony that “*Numazaki* does not teach a specific process for initiating the video capture as part of its fifth embodiment, but a [person having ordinary skill in the art] would have understood that this video capture process could be started using any of a number of standard methods for initiating a video,” and “*Numazaki*’s native functionality of associating hand gestures with commands would have been a natural fit as a means to initiate video capture.” Ex. 1003 ¶ 49. We find this testimony persuasive at this stage of the proceeding. *See KSR*, 550 U.S. at 417 (“[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.”).

Accordingly, we do not agree with Patent Owner’s arguments on this point at this stage of the proceeding. Based on the current record, we determine that Petitioner provides a reasonable basis for combining Numazaki’s embodiments.

Third, Patent Owner argues that “the Petition fails to explain why gesture-based image capture initiation provides ‘a greater degree of freedom’ than timers, especially when a timer can be set for any length of time, giving the user whatever time is needed to get into position and get prepared for the video capture.” Prelim. Resp. 16 (citing Pet. 21–22).

This argument is not persuasive because Petitioner is not required to show that the gesture-based image capture initiation provides a greater degree of freedom than timers. “[T]he question is whether there is something in the prior art as a whole to suggest the *desirability*, and thus the obviousness, of making the combination,’ not whether there is something in the prior art as a whole to suggest that the combination is the *most desirable* combination available.” *In re Fulton*, 391 F.3d 1195, 1200 (Fed. Cir. 2004) (quoting *In re Beattie*, 974 F.2d 1309, 1311 (Fed. Cir. 1992)). For the reasons discussed above, we determine that Petitioner establishes the desirability for making the proposed combination.

Fourth, Patent Owner challenges Petitioner’s argument that one of ordinary skill in the art would have anticipated success in combining Numazaki’s embodiments in the manner proposed because the Petition requires that the competing third and fifth embodiments of Numazaki be implemented. Prelim. Resp. 16 (citing Pet. 22–25). This argument is not persuasive because, for the reasons discussed above, we disagree that the third and fifth embodiments are “competing” to the degree that they are incompatible or teach away from combining aspects of the embodiments.

d) Conclusion

For the above reasons, we determine, based on the current record, that the Petition shows a reasonable likelihood that Petitioner would prevail in demonstrating that claim 1 is unpatentable over Numazaki and Nonaka.

4. Independent Claims 8 and 13

Independent claim 8 recites a computer implemented method having similar limitations as the device claim of claim 1. *Compare* Ex. 1001, 15:21–38 *with id.* at 16:1–13. For its analysis of claim 8, Petitioner refers back to its analysis of claim 1. Pet. 43–44. Similarly, independent claim 13 recites an image capture device having similar limitations as claim 1. *Compare* Ex. 1001, 15:21–38 *with id.* at 16:24–40. Petitioner also refers back to its analysis of claim 1 for its analysis of claim 13. Pet. 47–48.

Regarding claims 8 and 13, Patent Owner relies on substantially the same arguments as those advanced with respect to independent claim 1 (Prelim. Resp. 19–22, 24–26), which arguments we have found unpersuasive for the reasons discussed above. Accordingly, based on the current record, we determine that the Petition shows a reasonable likelihood that Petitioner would prevail in demonstrating that claims 8 and 13 are unpatentable over Numazaki and Nonaka.

5. Dependent Claims 4, 11, and 18

Claim 4 depends from claim 1 and recites that “the electro-optical sensor is fixed in relation to the digital camera.” Ex. 1001, 15:43–44. Claims 11 and 18 depend from claims 8 and 13, respectively, and similarly recite that the electro-optical sensor is fixed relative to the digital camera. *Id.* at 16:17–19, 16:49–50. For this feature, Petitioner asserts that

Numazaki’s fifth embodiment positions an electro-optical sensor (i.e., [r]eflected light extraction unit 102) and digital

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camera (i.e., visible light photo-detection array 351) side-by-side such that they have overlapping fields of view. Indeed, *Numazaki* expressly teaches that “visible light photo-detection array 351 and the reflected light extraction unit 102 are arranged in parallel.”

Pet. 38 (citing Ex. 1004, 39:4–44); *see also id.* at 47, 49 (asserting the same argument for claims 11 and 18). Petitioner does not direct us to any expert testimony supporting this assertion.

Patent Owner argues that the portion of *Numazaki* cited by Petitioner for this feature does not contain any description of whether reflected light extraction unit 102 and visible light photo-detection array 351 are fixed with respect to each other. Prelim. Resp. 18 (citing Ex. 1004, 39:4–44); *see also id.* at 23, 28 (making the same argument in connection with claims 11 and 18).

Petitioner appears to be arguing that *Numazaki*’s electro-optical sensor (reflected light extraction unit 102) and digital camera (visible light photo-detection array 351) must be fixed relative to each other because they are arranged in parallel. We are not persuaded, however, that being arranged in parallel necessarily means that reflected light extraction unit 102 and visible light photo-detection array 351 are fixed relative to each other. Accordingly, based on the current record, we question whether Petitioner establishes sufficiently that claims 4, 11, and 18 would have been obvious in view of *Numazaki* and *Nonaka*. Nevertheless, because Petitioner has demonstrated a reasonable likelihood of success in proving that at least one claim of the ’949 patent is unpatentable, we include this ground in the instituted *inter partes* review. *See SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1354, 1359–60 (2018); *see also PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018) (interpreting the statute to require “a simple yes-

or-no institution choice respecting a petition, embracing all challenges included in the petition”); Patent Trial and Appeal Board Consolidated Trial Practice Guide 64 (Nov. 2019) (“The Board will not institute on fewer than all claims or all challenges in a petition.”), *available at* <https://www.uspto.gov/TrialPracticeGuideConsolidated> (“TPG”).

6. Dependent Claims 2, 3, 5–7, 9, 10, 12, and 14–17

Petitioner provides reasonable and detailed explanations, supported by the testimony of Dr. Bederson, indicating where in the references the limitations of claims 2, 3, 5–7, 9, 10, 12, and 14–17 are disclosed. Pet. 33–43, 44, 47, 49. Further, Patent Owner offers no arguments particularly directed to claims 2, 3, 5–7, 9, 10, 12, and 14–17 for us to consider at this stage of the proceeding. Prelim. Resp. 17–19, 22, 23, 26–27. For these reasons, we determine that the information presented in the Petition establishes that there is a reasonable likelihood that Petitioner would prevail in its assertion that claims 2, 3, 5–7, 9, 10, 12, and 14–17 are unpatentable over Numazaki and Nonaka.

D. Asserted Obviousness Based on Numazaki, Nonaka, and Aviv

Petitioner argues that the combination of Numazaki, Nonaka, and Aviv renders obvious dependent claims 6, 12, and 17. Pet. 50–55. Patent Owner argues only that Aviv does not remedy the alleged deficiencies of Numazaki and Nonaka argued in connection with the independent claims. Prelim. Resp. 28.

We have reviewed Petitioner’s assertions with respect to these claims and the supporting evidence, and determine that the Petition shows a reasonable likelihood that Petitioner would prevail in demonstrating that claims 6, 12, and 17 are unpatentable over Numazaki, Nonaka, and Aviv.

E. Jurisdiction over Expired Patents

Patent Owner argues that the Board does not have jurisdiction over expired patents. Prelim. Resp. 28–29. Patent Owner argues:

35 U.S.C. § 2(a)(1) states that [the] United States Patent and Trademark Office “shall be responsible for the granting and issuing of patents. . . .” The Patent Trial [and] Appeal Board is required to “conduct inter partes reviews and post-grant reviews pursuant to chapters 31 and 32.” 35 U.S.C. § 6(b)(4). The burden of proof required to find a claim unpatentable is the preponderance of evidence, which is a lower burden of proof than the clear and convincing standard applied in district courts. 35 U.S.C. § 316(a)(9) requires that the Director prescribe regulations “setting forth standards and procedures for allowing the patent owner to move to amend the patent under subsection(d).” This is due, in part, to the fact that there is a lower burden of proof required before the Board.

Id. at 29.

Patent Owner appears to be arguing that, because 35 U.S.C. § 316(a)(9) requires the Director to establish procedures to allow for amendments of patents and that as expired patents cannot be amended, we do not have jurisdiction over expired patents in *inter partes* review. *Id.* Patent Owner concludes that as “[t]he ’949 Patent has expired, . . . the opportunity to amend the ’949 Patent is not available to Patent Owner” and therefore “determinations regarding the validity of this expired patent should be reserved for Article III courts under the clear and convincing standard.” *Id.*

Inter partes review of patents, whether expired or not, fits within the USPTO’s mandate “for the granting and issuing of patents” (35 U.S.C. § 2(a)(1)), for as the Supreme Court has stated, “[i]nter partes review is ‘a second look at an earlier administrative grant of a patent’” *Oil States Energy Servs., LLC v. Greene’s Energy Grp., LLC*, 138 S. Ct. 1365, 1374 (2018)

(quoting *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144 (2016)). Federal rule making has also noted that *inter partes* review covers expired patents. *See, e.g.*, 83 FR 51341 (Oct. 11, 2018) (Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board)⁶ (“The claim construction standard adopted in this final rule also is consistent with the same standard that the Office has applied in interpreting claims of expired patents and soon-to-be expired patents. *See, e.g., Wasica Fin. GmbH v. Cont’l Auto. Sys., Inc.*, 853 F.3d 1272, 1279 (Fed. Cir. 2017) (noting that “[t]he Board construes claims of an expired patent in accordance with *Phillips* . . . [and] [u]nder that standard, words of a claim are generally given their ordinary and customary meaning”).”).

Further, the statutes governing *inter partes* review do not limit them to non-expired patents. For example, 35 U.S.C. § 311(b), which sets forth the scope of *inter partes* review, merely refers to patents, with no mention of the expiration date. Further, 35 U.S.C. § 311(c), entitled “Filing Deadline,” makes no mention of the expiration date of the patent. Elsewhere, 35 U.S.C. § 315 does limit the filing of *inter partes* reviews based on civil actions and the serving of complaints, but again makes no mention of the expiration date of the patent. Patent Owner does not identify any statute that expressly limits *inter partes* review to non-expired patents.

Patent Owner fails to adequately explain why the requirement to establish procedures to allow for amendments to a patent means that expired patents are not subject to *inter partes* review. For example, the statute does not mandate that amendments to the patent be allowed in all cases.

⁶ Available at <https://www.federalregister.gov/d/2018-22006/p-13>.

For all of these reasons, we do not agree that the Board lacks jurisdiction over expired patents.

IV. CONCLUSION

After considering the evidence and arguments of record, we determine that Petitioner has demonstrated a reasonable likelihood of success with respect to at least one of the challenged claims. Accordingly, an *inter partes* review of all of the claims and all of the grounds presented in the Petition is hereby instituted. *See* 37 C.F.R. § 42.108(a); *SAS*, 138 S. Ct. at 1354, 1359–60; TPG 64.

At this stage of the proceeding, the Board has not made a final determination as to the patentability of any challenged claims or any underlying factual or legal issues. The final determination will be based on the record as developed during the *inter partes* review.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–18 of the '949 patent is instituted with respect to all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of the '949 patent shall commence on the entry date of this Order, and notice is hereby given of the institution of a trial.

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